

US-PAT-NO: 5599552
DOCUMENT-IDENTIFIER: US 5599552 A

TITLE: Biodegradable polymer composition

DATE-ISSUED: February 4, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Southard; George L.	Fort Collins	CO	N/A	N/A
Rogers; Jack A.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/423; 424/422, 424/424, 424/425, 424/426, 424/428, 424/486

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

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32. Document ID: US 5487897 A

L6: Entry 32 of 47

File: USPT

Jan 30, 1996

US-PAT-NO: 5487897

DOCUMENT-IDENTIFIER: US 5487897 A

TITLE: Biodegradable implant precursor

DATE-ISSUED: January 30, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Polson; Alan M.	Fort Collins	CO	N/A	N/A
Swanbom; Deryl D.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Cox; Charles P.	Fort Collins	CO	N/A	N/A
Norton; Richard L.	Fort Collins	CO	N/A	N/A
Lowe; Bryan K.	Fort Collins	CO	N/A	N/A
Peterson; Kenneth S.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/426; 424/425, 424/486, 514/772.3

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMC](#) | [Drawn Desc](#) | [Image](#)

33. Document ID: US 5368859 A

L6: Entry 33 of 47

File: USPT

Nov 29, 1994

US-PAT-NO: 5368859

DOCUMENT-IDENTIFIER: US 5368859 A

TITLE: Biodegradable system for regenerating the periodontium

DATE-ISSUED: November 29, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Southard; George L.	Fort Collins	CO	N/A	N/A
Rogers; Jack A.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/426; 424/423, 424/424, 424/425, 424/435, 514/900

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMC](#) | [Draw Desc](#) | [Image](#)

34. Document ID: US 5364627 A

L6: Entry 34 of 47

File: USPT

Nov 15, 1994

US-PAT-NO: 5364627

DOCUMENT-IDENTIFIER: US 5364627 A

TITLE: Gradual release structures made from fiber spinning techniques

DATE-ISSUED: November 15, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Song; Joo H.	Northbrook	IL	N/A	N/A

US-CL-CURRENT: 424/443; 424/405, 424/484, 426/548, 71/64.13

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMC](#) | [Draw Desc](#) | [Image](#)

35. Document ID: US 5340849 A

L6: Entry 35 of 47

File: USPT

Aug 23, 1994

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L6: Entry 15 of 47

File: USPT

Aug 31, 1999

US-PAT-NO: 5945115

DOCUMENT-IDENTIFIER: US 5945115 A

TITLE: Polymeric compositions useful as controlled release implants

DATE-ISSUED: August 31, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/422; 424/423, 424/424, 424/426, 424/427, 424/430, 424/434,
424/437, 523/105, 523/113

CLAIMS:

What is claimed is:

1. A composition suitable for in situ formation of an implant in an animal, comprising:
 - (a) a pharmaceutically acceptable, biodegradable thermoplastic polymer that is insoluble in aqueous or body fluids;
 - (b) a biocompatible organic solvent which solubilizes the thermoplastic polymer, is miscible to dispersible in aqueous or body fluids, and is capable of dissipating from the polymer system into surrounding tissue fluid whereupon the thermoplastic polymer forms the implant; and
 - (c) a biologically active agent capable of enhancing bone growth.
2. The composition of claim 1, further comprising a release rate modifying agent.
3. The composition of claim 1 wherein the biologically active material is demineralized bone matrix.
4. The composition of claim 1 wherein the biological active material is bone morphogenic protein.

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L6: Entry 10 of 47

File: USPT

Jun 27, 2000

DOCUMENT-IDENTIFIER: US 6080383 A

TITLE: Method and composition for the treatment of cancer by the enzymatic conversion of soluble radioactive toxic agents into radioactive toxic precipitates in the cancer

DEPR:

A specific example of the second method of dealing with an insoluble precipitable material is the application of chitin, (as an example of X+Y). Chitin is a highly insoluble molecule even when it has a low degree of polymerization (DP). Chitin can be solubilized by enzymatically or chemical deacetylation (removing Y) to form chitosan (X). Chitosan, a copolymer derived from the abundant natural polymer chitin, is composed of 2-amino-deoxy-D-glucose and 2-acetamide-2-deoxy-D-glucose units. Chitosan is soluble in water and can be depolymerized by nitrous acid (G. Graham Allan and Mark Peyron 1995, Carbohydrate Research, 277, 257-272) and by the action of chitinase (Usui T. et al. 1987, Biochim. Biophys. Acta, 923, 302-305) to generate oligomers of any required size. The soluble chitosan (X) with a degree of polymerization of 10-14 can be attached by conventional means in aqueous medium to a polymer of polyproline (P) of sufficient molecular size. The complex material (X+P) can be derivatized with acetic anhydride, without derivatizing or affecting the solubilizing effect of the acetic anhydride-resistant polyproline (P). The acetic anhydride re-acetylates the complex (adds Y to the chitosan component of the complex material) to form a chitin which remains soluble because of its attachment to the unchanged hydrophilic polyproline. The chitin material (X+Y) will remain soluble even though the chitosan (X) component of the material has been converted to chitin (X+Y) because of the solubilizing effect of the unchanged hydrophilic polyproline (P). The soluble precipitable material attached to the polyproline (X+Y+P) can now be attached to the targeting agent by conventional means in an aqueous medium to form a soluble binary reagent. The soluble binary reagent is transported by receptor mediated endocytosis to the lysosomes of the targeted cells. After the attached solubilizing polymer and targeting agent have been sufficiently digested by lysosomal enzymes, or after the bond between the chitin and the attached solubilizing polymer and targeting agent has been cleaved, their solubilizing effect will be dissipated, and the chitin portion of the binary complex, with or without an amino-acid or peptide "tail" left after the incomplete digestion of the targeting agent, will return to its insoluble state, and being insoluble and non-digestible, the chitin precipitates without the need for further enzyme action. Modifications of the chitin can be made to achieve certain characteristics. For example, chitin, can be made more aqueous soluble and more easily digested by mammalian and non-mammalian enzymes by a lower degree of chitosan acetylation.

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L6: Entry 12 of 47

File: USPT

Jan 18, 2000

DOCUMENT-IDENTIFIER: US 6015541 A

TITLE: Radioactive embolizing compositions

BSPR:

Biodegradable polymers are disclosed in the art.^{16,18} For example, Dunn, et al.¹⁶ discloses the following examples of biodegradable polymers: linear-chain polymers such as polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerate, polyalkylene oxalates, polyalkylene succinates, poly(malic acid), poly(amino acids), polyvinylpyrrolidone, polyethylene glycol, polyhydroxycellulose, chitin, chitosan, and copolymers, terpolymers and combinations thereof. Other biodegradable polymers include, for example, gelatin, collagen, etc.¹⁸

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File: USPT

Nov 23, 1999

DOCUMENT-IDENTIFIER: US 5990194 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DEPR:

A thermoplastic system is provided in which a solid, linear-chain, biodegradable polymer is dissolved in a biocompatible solvent to form a liquid, which can then be administered via a syringe and needle. Examples of biodegradable polymers which can be used in this application are polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid), poly(amino acids), polyvinylpyrrolidone, polyethylene glycol, polyhydroxycellulose, chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures of the above materials. The preferred polymers are those which have a lower degree of crystallization and are more hydrophobic. These polymers and copolymers are more soluble in the biocompatible solvents than the highly crystalline polymers such as polyglycolide and chitin which also have a high degree of hydrogen-bonding. Preferred materials with the desired solubility parameters are the polylactides, polycaprolactones, and copolymers of these with glycolide in which there are more amorphous regions to enhance solubility.

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L6: Entry 15 of 47

File: USPT

Aug 31, 1999

DOCUMENT-IDENTIFIER: US 5945115 A

TITLE: Polymeric compositions useful as controlled release implants

BSPR:

Suitable thermoplastic polymers for incorporation as the solid matrix of the controlled release polymer system are solids, pharmaceutically compatible and biodegradable by cellular action and/or by the action of body fluids. Examples of appropriate thermoplastic polymers include polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid) polymers, polymaleic anhydrides, poly(methylvinyl) ethers, poly(amino acids), chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures of the above materials.

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L6: Entry 18 of 47

File: USPT

Jul 14, 1998

US-PAT-NO: 5780044
DOCUMENT-IDENTIFIER: US 5780044 A

TITLE: Liquid delivery compositions

DATE-ISSUED: July 14, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yewey; Gerald L.	Fort Collins	CO	N/A	N/A
Krinick; Nancy L.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Radomsky; Michael L.	Mountain View	CA	N/A	N/A
Brouwer; Gerbrand	Menlo Park	CA	N/A	N/A
Tipton; Arthur J.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 424/426; 424/422, 424/423, 424/450, 424/489, 514/900, 525/937,
604/27, 604/48, 604/514, 604/890.1, 604/891.1

CLAIMS:

What is claimed is:

1. A delivery composition suitable for in situ formation of a solid implant for controlled release of an active agent, the composition comprising:
 - (a) a biocompatible organic solvent which has a solubility range of miscible to dispersible in aqueous medium;
 - (b) a biocompatible, biodegradable, thermoplastic polymer dissolved in the organic solvent, the thermoplastic polymer being insoluble in aqueous medium; and
 - (c) an active agent incorporated into a particulate controlled release component, the particulate controlled release component being suspended in the organic solvent wherein upon contacting an aqueous medium, the organic solvent dissipates or disperses into the aqueous medium and the thermoplastic polymer precipitates or coagulates to form the solid implant in which the particulate controlled release component is embedded.
2. The delivery composition of claim 1 wherein the particulate controlled release component includes a conjugate in which the active agent is covalently bonded to a carrier molecule.
3. The delivery composition of claim 1 wherein the particulate controlled release component is a microstructure selected from the group consisting of a microcapsule, a nanoparticle, a cyclodextrin, a liposome and a micelle.
4. The delivery composition of claim 1 wherein the particulate controlled release component is a microstructure of less than about 500 microns.
5. The delivery composition of claim 1 wherein the particulate controlled release component is a macrostructure selected from the group consisting of a fiber, film, rod, disc and cylinder.
6. The delivery composition of claim 1 wherein the particulate controlled release component is a macrostructure of at least 500 microns.
7. The delivery composition of claim 1 wherein the solid implant includes a skin and a core, the skin having pores with a substantially smaller diameter than the core.

WEST

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L6: Entry 18 of 47

File: USPT

Jul 14, 1998

DOCUMENT-IDENTIFIER: US 5780044 A
TITLE: Liquid delivery compositions

DEPR:

Thermoplastic polymers that are suitable for use in the polymer solution generally include any having the foregoing characteristics. Examples are polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(amino acids), poly(methyl vinyl ether), poly(maleic anhydride), chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures therein. Polylactides, polycaprolactones, polyglycolides and copolymers thereof are highly preferred thermoplastic polymers.

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L6: Entry 22 of 47

File: USPT

Apr 14, 1998

DOCUMENT-IDENTIFIER: US 5739176 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DEPR:

A thermoplastic system is provided in which a solid, linear-chain, biodegradable polymer is dissolved in a biocompatible solvent to form a liquid, which can then be administered via a syringe and needle. Examples of biodegradable polymers which can be used in this application are polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid), poly(amino acids), polyvinylpyrrolidone, polyethylene glycol, polyhydroxycellulose, chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures of the above materials. The preferred polymers are those which have a lower degree of crystallization and are more hydrophobic. These polymers and copolymers are more soluble in the biocompatible solvents than the highly crystalline polymers such as polyglycolide and chitin which also have a high degree of hydrogen-bonding. Preferred materials with the desired solubility parameters are the polylactides, polycaprolactones, and copolymers of these with glycolide in which there are more amorphous regions to enhance solubility.

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L6: Entry 25 of 47

File: USPT

Mar 10, 1998

US-PAT-NO: 5725491

DOCUMENT-IDENTIFIER: US 5725491 A

TITLE: Method of forming a biodegradable film dressing on tissue

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Fujita; Shawn M.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 602/43; 424/426, 424/78.06, 602/52, 602/904, 604/290

CLAIMS:

What is claimed is:

1. A method of forming an in situ microporous biodegradable film dressing on human or animal tissue, comprising:
 - (a) dispensing an effective amount of a liquid polymer composition on the tissue, the liquid polymer composition having a formulation of,
 - (i) a biodegradable or bioerodible thermoplastic polymer insoluble in an aqueous based fluid; and
 - (ii) an organic solvent miscible to dispersible in the aqueous based fluid; and
 - (b) contacting the liquid polymer composition with the aqueous based fluid that is applied to the tissue before dispensing step (a) and to the liquid polymer composition after dispensing step (a) to coagulate or solidify the composition to form the film dressing on the tissue.
2. The method of claim 1, wherein the dispensing step includes spraying, painting, or squirting the liquid polymer composition on the tissue.

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L6: Entry 26 of 47

File: USPT

Feb 10, 1998

DOCUMENT-IDENTIFIER: US 5717030 A

TITLE: Adjunctive polymer system for use with medical device

BSPR:

The thermoplastic polymer can be a homopolymer, copolymer, terpolymer, etc. Examples of suitable thermoplastic polymers which can be used to form the solid matrix include polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid) polymers, polymaleic anhydrides, poly(methylvinyl) ethers, poly(amino acids), chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures of the above materials, and with other materials.

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L6: Entry 30 of 47

File: USPT

May 27, 1997

US-PAT-NO: 5632727

DOCUMENT-IDENTIFIER: US 5632727 A

TITLE: Biodegradable film dressing and method for its formation

DATE-ISSUED: May 27, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Birmingham	AL	N/A	N/A
Fujita; Shawn M.	Amsterdam	N/A	N/A	NLX
Dunn; Richard L.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 602/47; 424/426, 602/900, 602/904, 604/890.1

CLAIMS:

What is claimed is:

1. A biodegradable microporous film dressing comprised of a skin and a core portion, the skin portion having pores with a smaller diameter than pores of the core portion; wherein the film dressing is formed by contacting a composition comprising a biodegradable thermoplastic polymer that is insoluble in aqueous or body fluids, and an organic solvent that is soluble in aqueous or body fluids, with an aqueous or body fluid whereupon the composition coagulates or solidifies to form the microporous film dressing.
2. The film dressing of claim 1, wherein the film dressing is formed by administering the composition onto a tissue, and the core portion of the film dressing is oriented under the skin portion and in contact with the tissue.
3. The film dressing of claim 1, wherein the film dressing is formed by administering the composition onto a tissue, and the skin portion of the film dressing is oriented under the core portion and in contact with the tissue.
4. The microporous film dressing of claim 1, wherein the biodegradable thermoplastic polymer is selected from the group consisting of polylactides, polyglycolides, polycaprolactones, polyethylene glycols, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(amino acids), poly(methyl vinyl ether) and copolymers, terpolymers, and combinations thereof.
5. The microporous film dressing of claim 1, wherein the organic solvent is selected from the group consisting of N-methyl-2-pyrrolidone, 2-pyrrolidone, acetone, acetic acid, ethyl acetate, ethyl lactate, methyl acetate, methyl ethyl ketone, dimethylformamide, dimethylsulfoxide, dimethyl sulfone, tetrahydrofuran, caprolactam, decylmethylsulfoxide, oleic acid, propylene carbonate, N,N-diethyl-m-toluamide, and 1-dodecylazacycloheptan-2-one, and mixtures thereof.
6. The microporous film dressing of claim 1, wherein the diameter of the pores of the skin portion and the core portion is about 3-500 microns.
7. The microporous film dressing of claim 1, wherein the biodegradable film is capable of providing a mechanical barrier, a microbial barrier, or a combination thereof, on a tissue.
8. The microporous film dressing of claim 1, wherein water, oxygen, nutrients,

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File: USPT

Feb 4, 1997

US-PAT-NO: 5599552

DOCUMENT-IDENTIFIER: US 5599552 A

TITLE: Biodegradable polymer composition

DATE-ISSUED: February 4, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Southard; George L.	Fort Collins	CO	N/A	N/A
Rogers; Jack A.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/423; 424/422, 424/424, 424/425, 424/426, 424/428, 424/486

CLAIMS:

What is claimed is:

1. A composition suitable for forming an in situ solid implant in an animal, comprising: a formulation of a biodegradable, thermoplastic polymer that is insoluble in aqueous or body fluid, and an organic solvent that is miscible to dispersible in aqueous or body fluid, the composition being capable of coagulating or solidifying to form a solid microporous implant upon its contact with an aqueous or body fluid, the implant being a core surrounded by a skin, and the core and skin both being porous.
2. The composition of claim 1, wherein the organic solvent is a mixture of a first organic solvent that is a good solvent for the thermoplastic polymer, and a second organic solvent that is a poorer solvent or a non-solvent for the thermoplastic polymer; said first and second solvents included in said mixture at a ratio such that the thermoplastic polymer is soluble therein and coagulates to form a solid matrix upon placing the composition within the body and the dissipation or diffusion of the solvent into body fluid.
3. A method of forming an implant suitable for altering a biological or physiological activity in an animal, comprising: administering to the animal composition in an amount effective to form in situ a solid implant, the composition being a liquid formulation of a biodegradable thermoset polymer that is insoluble in aqueous or body fluid and the composition undergoing curing to form a microporous matrix, the matrix being a core surrounded by a skin, the core and skin both being porous.
4. A composition according to claim 1, further comprising a pore-forming agent.
5. A composition according to claim 4, wherein the pore-forming agent is a sugar, salt, or water-soluble polymer, or water-insoluble substance that degrades to a water soluble substance.
6. A composition according to claim 1, wherein the thermoplastic polymer is selected from the group consisting of polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, polyamino acids, polymethyl vinyl ether, and copolymers, terpolymers, and any combination

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File: USPT

Feb 4, 1997

DOCUMENT-IDENTIFIER: US 5599552 A
TITLE: Biodegradable polymer composition

BSPR:

The kinds of thermoplastic polymers suitable for the present composition generally include any having the foregoing characteristics. Examples are polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid), poly(amino acids), poly(methyl vinyl ether), poly(maleic anhydride), chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures therein. Polylactides, polycaprolactones, polyglycolides and copolymers thereof are highly preferred thermoplastic polymers.

BSPR:

The thermosetting prepolymers are also short chain polyol derivatives of the thermoplastic polymers described herein. The polyol terminated derivatives are converted to acrylic ester terminated prepolymers by any suitable method. Examples are short chain polyol derivatives of polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid), poly(amino acids), poly(methyl vinyl ether), poly(maleic anhydride), chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures therein.

CLPR:

17. A composition according to claim 16, wherein the acrylic ester-terminated biodegradable prepolymer is selected from the group consisting of polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerates, polyalkylene oxalates, polyalkylene succinates, poly(malic acid), poly(amino acids), poly(methyl vinyl ether), chitin, chitosan, and copolymers, terpolymers, and any combination thereof.

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File: USPT

May 4, 1993

US-PAT-NO: 5208166

DOCUMENT-IDENTIFIER: US 5208166 A

TITLE: Reactive chitosan coated articles and test kit for immunoassay

DATE-ISSUED: May 4, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Saunders; Mary S.	Monticello	FL	32344	N/A
Pegg; Randall K.	Amelia Island	FL	32034	N/A

US-CL-CURRENT: 436/518; 422/57, 422/61, 427/2.13, 427/337, 427/338, 427/414,
435/7.8, 436/528, 436/529, 436/808, 436/809, 514/55, 536/20

CLAIMS:

What is claimed is:

1. An apparatus for performing an immunoassay comprising:
 - a) a substrate;
 - b) a surface coating member on said substrate comprising a composition of chitosan, either natural or synthetic, and a polyvalent organic acid;
 - c) said chitosan of said surface coating member further reacted with an oxidizer to produce a reactive moiety on said surface member;
 - d) an immunochemical reagent member covalently bound to said surface coating member via said reactive moiety, thereby insolubilized on said substrate.
2. The apparatus of claim 1 wherein said substrate comprises a microtiter well.
3. The apparatus according to claim 1 wherein said polyvalent organic acid is selected from the group consisting of citric acid, aspartic acid, malic acid, ascorbic acid, fumaric acid, glutaric acid, and combinations thereof.
4. The apparatus according to claim 1 wherein said immunochemical reagent member comprises antibodies which specifically bind an analyte selected from the group consisting of drugs of abuse, therapeutic drugs, hormones, antibiotics, mycotoxins, xenobiotics, microbial antigens, mammalian antigens, and tumor markers, said reagent member bound to said substrate by said surface coating member.
5. The apparatus of claim 1 wherein said oxidizer is selected from the group consisting of nitrite, hypochlorite, sulfite, and combinations thereof.
6. A kit for performing an immunoassay comprising
 - a) a substrate,
 - b) a composition for coating said substrate comprising chitosan and a polyvalent organic acid selected from the group consisting of citric acid, aspartic acid, malic acid, ascorbic acid, fumaric acid, glutaric acid, and combinations thereof in a single container;
 - c) an oxidizing agent for reaction with the chitosan of said composition selected from the group consisting of nitrite, hypochlorite, sulfite, and combinations thereof in a separate container; and
 - d) an agent for inhibiting nonspecific binding reactions on said substrate coated with said composition.
7. An apparatus providing reactive surfaces useful in immunoassay procedures comprising:
 - a) a substrate;

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L6: Entry 12 of 47

File: USPT

Jan 18, 2000

US-PAT-NO: 6015541

DOCUMENT-IDENTIFIER: US 6015541 A

TITLE: Radioactive embolizing compositions

DATE-ISSUED: January 18, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Greff; Richard J.	St. Pete Beach	FL	N/A	N/A
Wallace; George	Coto de Caza	CA	N/A	N/A

US-CL-CURRENT: 424/1.25; 424/1.29, 424/1.33, 600/3, 600/4[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [KIMC](#) | [Draw Desc](#) | [Image](#) 13. Document ID: US 5990194 A

L6: Entry 13 of 47

File: USPT

Nov 23, 1999

US-PAT-NO: 5990194

DOCUMENT-IDENTIFIER: US 5990194 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
English; James P.	Birmingham	AL	N/A	N/A
Cowsar; Donald R.	Birmingham	AL	N/A	N/A
Vanderbilt; David P.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 523/113; 424/423, 424/426, 525/190, 525/411, 525/412, 525/415,
525/439, 525/450, 604/500, 604/507[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [KIMC](#) | [Draw Desc](#) | [Image](#) 14. Document ID: US 5968542 A

L6: Entry 14 of 47

File: USPT

Oct 19, 1999

US-PAT-NO: 5968542

DOCUMENT-IDENTIFIER: US 5968542 A

TITLE: High viscosity liquid controlled delivery system as a device

DATE-ISSUED: October 19, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 424/423; 424/426, 428/402.22, 436/829

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMC](#) | [Draw Desc](#) | [Image](#)

15. Document ID: US 5945115 A

L6: Entry 15 of 47

File: USPT

Aug 31, 1999

US-PAT-NO: 5945115

DOCUMENT-IDENTIFIER: US 5945115 A

TITLE: Polymeric compositions useful as controlled release implants

DATE-ISSUED: August 31, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/422; 424/423, 424/424, 424/426, 424/427, 424/430, 424/434,
424/437, 523/105, 523/113

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMC](#) | [Draw Desc](#) | [Image](#)

16. Document ID: US 5816259 A

L6: Entry 16 of 47

File: USPT

Oct 6, 1998

US-PAT-NO: 5816259

DOCUMENT-IDENTIFIER: US 5816259 A

TITLE: Method for the diagnosis and treatment of cancer by the accumulation of radioactive precipitates in targeted cells

DATE-ISSUED: October 6, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rose; Samuel	Oakland	CA	94608	N/A

US-CL-CURRENT: 128/898; 424/178.1

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMC](#) | [Draw Desc](#) | [Image](#)

 17. Document ID: US 5792469 A

L6: Entry 17 of 47

File: USPT

Aug 11, 1998

US-PAT-NO: 5792469

DOCUMENT-IDENTIFIER: US 5792469 A

TITLE: Biodegradable in situ forming film dressing

DATE-ISSUED: August 11, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Fujita; Shawn M.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/422; 424/426, 424/45, 424/78.06, 523/113, 604/218[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KDDC](#) | [Drawn Desc](#) | [Image](#)

 18. Document ID: US 5780044 A

L6: Entry 18 of 47

File: USPT

Jul 14, 1998

US-PAT-NO: 5780044

DOCUMENT-IDENTIFIER: US 5780044 A

TITLE: Liquid delivery compositions

DATE-ISSUED: July 14, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yewey; Gerald L.	Fort Collins	CO	N/A	N/A
Krinick; Nancy L.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Radomsky; Michael L.	Mountain View	CA	N/A	N/A
Brouwer; Gerbrand	Menlo Park	CA	N/A	N/A
Tipton; Arthur J.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 424/426; 424/422, 424/423, 424/450, 424/489, 514/900, 525/937,
604/27, 604/48, 604/514, 604/890.1, 604/891.1[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KDDC](#) | [Drawn Desc](#) | [Image](#)

 19. Document ID: US 5759563 A

L6: Entry 19 of 47

File: USPT

Jun 2, 1998

US-PAT-NO: 5759563

DOCUMENT-IDENTIFIER: US 5759563 A

TITLE: Liquid delivery compositions

DATE-ISSUED: June 2, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yewey; Gerald L.	Fort Collins	CO	N/A	N/A
Krinick; Nancy L.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Radomsky; Michael L.	Mountain View	CA	N/A	N/A
Brouwer; Gerbrand	Menlo Park	CA	N/A	N/A
Tipton; Arthur J.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 424/426; 424/445, 424/450, 424/484, 424/486, 424/488, 424/489,
604/891.1

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMD](#) | [Draw Desc](#) | [Image](#)

20. Document ID: US 5747058 A

L6: Entry 20 of 47

File: USPT

May 5, 1998

US-PAT-NO: 5747058

DOCUMENT-IDENTIFIER: US 5747058 A

TITLE: High viscosity liquid controlled delivery system

DATE-ISSUED: May 5, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Birmingham	AL	N/A	N/A
Holl; Richard J.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 424/423; 424/430, 424/435, 424/436, 424/443, 424/45, 424/451,
424/464

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMD](#) | [Draw Desc](#) | [Image](#)

21. Document ID: US 5744153 A

L6: Entry 21 of 47

File: USPT

Apr 28, 1998

US-PAT-NO: 5744153

DOCUMENT-IDENTIFIER: US 5744153 A

TITLE: Liquid delivery compositions

DATE-ISSUED: April 28, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yewey; Gerald L.	Fort Collins	CO	N/A	N/A
Krinick; Nancy L.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Radomsky; Michael L.	Mountain View	CA	N/A	N/A
Brouwer; Gerbrand	Menlo Park	CA	N/A	N/A
Tipton; Arthur J.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 424/426; 424/422, 424/423, 424/450, 424/489, 514/900, 525/937,
604/27, 604/48, 604/514, 604/890.1, 604/891.1[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) 22. Document ID: US 5739176 A

L6: Entry 22 of 47

File: USPT

Apr 14, 1998

US-PAT-NO: 5739176

DOCUMENT-IDENTIFIER: US 5739176 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DATE-ISSUED: April 14, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
English; James P.	Birmingham	AL	N/A	N/A
Cowsar; Donald R.	Birmingham	AL	N/A	N/A
Vanderbilt; David D.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 523/113; 424/422, 424/78.38, 523/115, 524/601, 524/96, 525/408,
525/412, 525/413, 525/937, 604/290, 604/506[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) 23. Document ID: US 5733950 A

L6: Entry 23 of 47

File: USPT

Mar 31, 1998

US-PAT-NO: 5733950

DOCUMENT-IDENTIFIER: US 5733950 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DATE-ISSUED: March 31, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
English; James P.	Birmingham	AL	N/A	N/A
Cowsar; Donald R.	Birmingham	AL	N/A	N/A
Vanderbilt; David P.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 523/113; 424/422, 424/78.38, 523/115, 524/96, 525/413, 525/450,
604/506

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMM](#) | [Drawn Desc](#) | [Image](#)

24. Document ID: US 5726123 A

L6: Entry 24 of 47

File: USPT

Mar 10, 1998

US-PAT-NO: 5726123

DOCUMENT-IDENTIFIER: US 5726123 A

TITLE: Method for treating cotyledonous plants

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heinsohn; George E.	Elkton	MD	N/A	N/A
Bjornson; August S.	Wilmington	DE	N/A	N/A

US-CL-CURRENT: 504/140; 504/100, 504/118, 504/147, 504/292, 504/319, 504/335,
514/55, 536/20, 71/27

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMM](#) | [Drawn Desc](#) | [Image](#)

25. Document ID: US 5725491 A

L6: Entry 25 of 47

File: USPT

Mar 10, 1998

US-PAT-NO: 5725491

DOCUMENT-IDENTIFIER: US 5725491 A

TITLE: Method of forming a biodegradable film dressing on tissue

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Fujita; Shawn M.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 602/43; 424/426, 424/78.06, 602/52, 602/904, 604/290

[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#)

[KMC](#) [Draw Desc](#) [Image](#)

26. Document ID: US 5717030 A

L6: Entry 26 of 47

File: USPT

Feb 10, 1998

US-PAT-NO: 5717030

DOCUMENT-IDENTIFIER: US 5717030 A

TITLE: Adjunctive polymer system for use with medical device

DATE-ISSUED: February 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Yewey; Gerald L.	Fort Collins	CO	N/A	N/A
Southard; Jeffrey L.	Fort Collins	CO	N/A	N/A
Urheim; John E.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 523/111; 424/426, 424/447, 424/78.06, 523/113, 528/905, 602/52,
602/904

[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#)

[KMC](#) [Draw Desc](#) [Image](#)

27. Document ID: US 5707647 A

L6: Entry 27 of 47

File: USPT

Jan 13, 1998

US-PAT-NO: 5707647

DOCUMENT-IDENTIFIER: US 5707647 A

TITLE: Adjunctive polymer system for use with medical device

DATE-ISSUED: January 13, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Yewey; Gerald L.	Fort Collins	CO	N/A	N/A
Southard; Jeffrey L.	Fort Collins	CO	N/A	N/A
Urheim; John E.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/443; 128/898, 424/426, 424/447, 424/78.06, 523/111, 523/113,
528/905, 602/52, 602/904[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) 28. Document ID: US 5702716 A

L6: Entry 28 of 47

File: USPT

Dec 30, 1997

US-PAT-NO: 5702716

DOCUMENT-IDENTIFIER: US 5702716 A

TITLE: Polymeric compositions useful as controlled release implants

DATE-ISSUED: December 30, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/422; 424/423, 424/424, 424/426, 424/427, 424/430, 424/434,
424/437, 523/105, 523/113[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) 29. Document ID: US 5660849 A

L6: Entry 29 of 47

File: USPT

Aug 26, 1997

US-PAT-NO: 5660849

DOCUMENT-IDENTIFIER: US 5660849 A

TITLE: Apparatus for forming a biodegradable implant precursor

DATE-ISSUED: August 26, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Polson; Alan M.	Fort Collins	CO	N/A	N/A
Swanbom; Deryl D.	Fort Collins	CO	N/A	N/A
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Cox; Charles P.	Fort Collins	CO	N/A	N/A
Norton; Richard L.	Fort Collins	CO	N/A	N/A
Lowe; Bryan K.	Fort Collins	CO	N/A	N/A
Peterson; Kenneth S.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/426; 424/422, 424/423, 424/428

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMD](#) | [Drawn Desc](#) | [Image](#)

30. Document ID: US 5632727 A

L6: Entry 30 of 47

File: USPT

May 27, 1997

US-PAT-NO: 5632727

DOCUMENT-IDENTIFIER: US 5632727 A

TITLE: Biodegradable film dressing and method for its formation

DATE-ISSUED: May 27, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tipton; Arthur J.	Birmingham	AL	N/A	N/A
Fujita; Shawn M.	Amsterdam	N/A	N/A	NLX
Dunn; Richard L.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 602/47; 424/426, 602/900, 602/904, 604/890.1

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KMD](#) | [Drawn Desc](#) | [Image](#)

31. Document ID: US 5599552 A

L6: Entry 31 of 47

File: USPT

Feb 4, 1997

US-PAT-NO: 5340849

DOCUMENT-IDENTIFIER: US 5340849 A

TITLE: Biodegradable in-situ forming implants and methods for producing the same

DATE-ISSUED: August 23, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
English; James P.	Birmingham	AL	N/A	N/A
Cowsar; Donald R.	Birmingham	AL	N/A	N/A
Vanderbilt; David D.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 523/113; 424/422, 424/426, 424/78.26, 424/78.27, 424/78.37,
525/411, 525/937

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KUMC](#) | [Drawn Desc](#) | [Image](#)

36. Document ID: US 5324519 A

L6: Entry 36 of 47

File: USPT

Jun 28, 1994

US-PAT-NO: 5324519

DOCUMENT-IDENTIFIER: US 5324519 A

TITLE: Biodegradable polymer composition

DATE-ISSUED: June 28, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Southard; George L.	Fort Collins	CO	N/A	N/A
Rogers; Jack A.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/426; 424/422, 424/423, 424/424, 424/425, 424/486

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KUMC](#) | [Drawn Desc](#) | [Image](#)

37. Document ID: US 5278202 A

L6: Entry 37 of 47

File: USPT

Jan 11, 1994

US-PAT-NO: 5278202

DOCUMENT-IDENTIFIER: US 5278202 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DATE-ISSUED: January 11, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
English; James P.	Birmingham	AL	N/A	N/A
Cowsar; Donald R.	Birmingham	AL	N/A	N/A
Vanderbilt; David D.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 523/113; 424/422, 424/426, 424/78.26, 525/411, 525/415, 525/937,
526/320, 526/321, 604/187[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#)

 38. Document ID: US 5278201 A

L6: Entry 38 of 47

File: USPT

Jan 11, 1994

US-PAT-NO: 5278201

DOCUMENT-IDENTIFIER: US 5278201 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DATE-ISSUED: January 11, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
English; James P.	Birmingham	AL	N/A	N/A
Cowsar; Donald R.	Birmingham	AL	N/A	N/A
Vanderbilt; David P.	Birmingham	AL	N/A	N/A

US-CL-CURRENT: 523/113; 424/422, 424/426, 524/113, 524/173, 524/233, 524/361,
524/386, 524/391, 525/937, 604/218[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#)

 39. Document ID: US 5208166 A

L6: Entry 39 of 47

File: USPT

May 4, 1993

US-PAT-NO: 5208166

DOCUMENT-IDENTIFIER: US 5208166 A

TITLE: Reactive chitosan coated articles and test kit for immunoassay

DATE-ISSUED: May 4, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Saunders; Mary S.	Monticello	FL	32344	N/A
Pegg; Randall K.	Amelia Island	FL	32034	N/A

US-CL-CURRENT: 436/518; 422/57, 422/61, 427/2.13, 427/337, 427/338, 427/414,
435/7.8, 436/528, 436/529, 436/808, 436/809, 514/55, 536/20

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KINIC](#) | [Drawn Desc](#) | [Image](#)

40. Document ID: US 5198251 A

L6: Entry 40 of 47

File: USPT

Mar 30, 1993

US-PAT-NO: 5198251

DOCUMENT-IDENTIFIER: US 5198251 A

TITLE: Gradual release structures for chewing gum

DATE-ISSUED: March 30, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Song; Joo H.	Northbrook	IL	N/A	N/A
Copper; Charles M.	Westmont	IL	N/A	N/A
Spisiak, Jr.; Daniel R.	Elmhurst	IL	N/A	N/A

US-CL-CURRENT: 426/5; 426/517, 426/96

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KINIC](#) | [Drawn Desc](#) | [Image](#)

41. Document ID: US 5165944 A

L6: Entry 41 of 47

File: USPT

Nov 24, 1992

US-PAT-NO: 5165944

DOCUMENT-IDENTIFIER: US 5165944 A

TITLE: Gradual release structures for chewing gum

DATE-ISSUED: November 24, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Song; Joo H.	Northbrook	IL	N/A	N/A
Copper; Charles M.	Westmont	IL	N/A	N/A

US-CL-CURRENT: 426/5; 426/516, 426/517, 426/548, 426/804, 426/96

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) **42. Document ID: US 5108762 A**

L6: Entry 42 of 47

File: USPT

Apr 28, 1992

US-PAT-NO: 5108762

DOCUMENT-IDENTIFIER: US 5108762 A

TITLE: Gradual release structures for chewing gum

DATE-ISSUED: April 28, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Broderick; Kevin B.	Berwyn	IL	N/A	N/A
Song; Joo H.	Northbrook	IL	N/A	N/A
Campbell; Adebisi A.	Chicago	IL	N/A	N/A
Zibell; Steve E.	Tinley Park	IL	N/A	N/A
Patel; Mansukh M.	Downers Grove	IL	N/A	N/A

US-CL-CURRENT: 426/5; 426/548, 426/804[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) **43. Document ID: US 5077049 A**

L6: Entry 43 of 47

File: USPT

Dec 31, 1991

US-PAT-NO: 5077049

DOCUMENT-IDENTIFIER: US 5077049 A

TITLE: Biodegradable system for regenerating the periodontium

DATE-ISSUED: December 31, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	N/A	N/A
Tipton; Arthur J.	Fort Collins	CO	N/A	N/A
Southard; George L.	Fort Collins	CO	N/A	N/A
Rogers; Jack A.	Fort Collins	CO	N/A	N/A

US-CL-CURRENT: 424/426; 424/422, 424/423, 424/425, 424/435[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KMC](#) | [Draw Desc](#) | [Image](#) **44. Document ID: US 5015293 A**

L6: Entry 44 of 47

File: USPT

May 14, 1991

US-PAT-NO: 5015293

DOCUMENT-IDENTIFIER: US 5015293 A

TITLE: Method of forming a crosslinked chitosan polymer and product thereof

DATE-ISSUED: May 14, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayer; Jean M.	Smithfield	RI	N/A	N/A
Kaplan; David L.	Stow	MA	N/A	N/A

US-CL-CURRENT: 106/162.2; 106/162.9, 523/128, 523/447, 536/20

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KIMC](#) | [Drawn Desc](#) | [Image](#)

45. Document ID: US 4996307 A

L6: Entry 45 of 47

File: USPT

Feb 26, 1991

US-PAT-NO: 4996307

DOCUMENT-IDENTIFIER: US 4996307 A

TITLE: Preparation of water-soluble acylated chitosan

DATE-ISSUED: February 26, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Itoi; Hiroshi	Kamagaya	N/A	N/A	JPX
Sano; Hiroshi	Narashino	N/A	N/A	JPX
Shibasaki; Kenichiro	Tokyo	N/A	N/A	JPX

US-CL-CURRENT: 536/20; 536/55.3

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)

[KIMC](#) | [Drawn Desc](#) | [Image](#)

46. Document ID: US 4978537 A

L6: Entry 46 of 47

File: USPT

Dec 18, 1990

US-PAT-NO: 4978537

DOCUMENT-IDENTIFIER: US 4978537 A

TITLE: Gradual release structures for chewing gum

DATE-ISSUED: December 18, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Song; Joo H.	Skokie	IL	N/A	N/A

US-CL-CURRENT: 426/5; 426/303, 426/307, 426/310, 426/548, 426/658, 426/96,
426/97, 426/99

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KWMC](#) | [Draw Desc](#) | [Image](#) 47. Document ID: US 4938763 A

L6: Entry 47 of 47

File: USPT

Jul 3, 1990

US-PAT-NO: 4938763

DOCUMENT-IDENTIFIER: US 4938763 A

TITLE: Biodegradable in-situ forming implants and methods of producing the same

DATE-ISSUED: July 3, 1990

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dunn; Richard L.	Fort Collins	CO	80526	N/A
English; James P.	Birmingham	AL	35214	N/A
Cowsar; Donald R.	Birmingham	AL	35213	N/A
Vanderbilt; David P.	Birmingham	AL	35204	N/A

US-CL-CURRENT: 604/891.1[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KWMC](#) | [Draw Desc](#) | [Image](#)

Terms	Documents
Chitosan adj copolymer	47

Documents, starting with Document:

Display Format: